IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Hyun-Woo LEE et al.	Examiner: Anh Vu H. LY
Serial No.:	09/972,814	Group Art Unit: 2472
Filed:	October 5, 2001	Docket: 678-752
		Dated: August 4, 2010

For: **TSTD APPARATUS AND METHOD FOR A TDD CDMA MOBILE COMMUNICATION SYSTEM**

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313

TRANSMITTAL OF APPELLANTS' BRIEF ON APPEAL

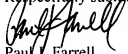
Sir:

Enclosed please find APPELLANTS' BRIEF.

Also enclosed is a credit card payment in the amount of $540.00 to cover the appeal fee.

If the enclosed credit card payment is insufficient for any reason or becomes detached, please charge the required fee under 37 C.F.R. §1.17 to Deposit Account No. 50-4053. Also, in the event any additional extensions of time are required, please treat this paper as a petition to extend the time as required and charge Deposit Account No. 50-4053.

Respectfully submitted,



Paul J. Farrell
Reg. No.: 33,494
Attorney for Applicant(s)

THE FARRELL LAW FIRM
290 Broadhollow Road, Suite 210 E
Melville, New York 11747
516-228-3565

Attorney Docket No.: 678-752 (P9924)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPLICANT(S):	Hyun-Woo LEE et al.	**ART UNIT:**	2472
APPLICATION NO.:	09/972,814	**EXAMINER:**	Anh Vu H. LY
FILING DATE:	October 5, 2001	**DATED:**	August 4, 2010

FOR: **TSTD APPARATUS AND METHOD FOR A TDD CDMA MOBILE COMMUNICATION SYSTEM**

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANTS' BRIEF ON APPEAL

REAL PARTY IN INTEREST

The real party in interest is Samsung Electronics Co., Ltd., the assignee of the subject application, having an office at 416, Maetan-dong, Yeongtong-gu, Suwon-si, Gyeonggi-do, Republic of Korea.

RELATED APPEALS AND INTERFERENCES

To the best of Appellants' knowledge and belief, there are no currently pending related appeals, interferences or judicial proceedings.

STATUS OF CLAIMS

The original application filed on October 5, 2001 contained Claims 1-35. In a response dated July 8, 2005, Claims 28-35 were cancelled without prejudice. In a response dated January 26, 2006, Claims 1, 2, 5, 6, 8, 10, 12, 14, 15, 17, 18, 20, 22, 24, 25 and 27 were amended, Claims 36 and 37 were added, and Claims 9, 13, 16, 19, 23 and 26 were cancelled without prejudice. In a response dated August 21, 2006, Claims 1, 5, 8, 11, 12, 15, 18, 21, 22 and 25 were amended, and Claims 10, 20, 36 and 37 were cancelled without prejudice. In a response dated April 30, 2007, Claims 1, 5, 8 and 18 were amended, and Claim 38 was added. In a response dated October 5, 2007, Claims 1, 3-5, 7, 8, 18 and 38 were amended, and Claims 2 and 6 were cancelled without prejudice. In a response dated August 4, 2008, Claims 1, 5, 8, 18 and 38 were amended. In a response dated February 19, 2009, Claims 39-41 were added. In a response dated April 5, 2010, Claim 38 was amended.

Thus, Claims 1, 3-5, 7, 8, 11, 12, 14, 15, 17, 18, 21, 22, 24, 25, 27 and 38-41 are pending. Claims 1, 5, 8, 18, 38 and 40 are in independent form. Claims 1, 3, 5, 7, 8, 11, 12, 14, 15, 17, 18, 21, 22, 24, 25, 27 and 38-41 stand rejected and are appealed.

STATUS OF AMENDMENTS

To date, all of the amendments to the claims have been entered. Thus, the Appendix to this Appeal Brief includes Claims 1, 3-5, 7, 8, 11, 12, 14, 15, 17, 18, 21, 22, 24, 25, 27 and 38-41, of which the status of Claims 1, 5, 8, 11, 12, 14, 15, 17, 18, 21, 22, 24, 25, 27 and 38-41 are indicated as "Previously Presented," and the status of Claims 3, 4 and 7 are indicated as "Original."

SUMMARY OF CLAIMED SUBJECT MATTER

The invention, as recited in Claim 1, relates to a transmission apparatus in a CDMA (Code Division Multiple Access) mobile communication system for transmitting a modulated radio signal

using a plurality of antennas. (Specification, page 15, lines 24-25) [1]. The transmission apparatus comprises a power amplifier for amplifying the modulated radio signal in a transmission period. (Specification, page 20, line 15, and FIG. 11, 1126). The transmission apparatus also comprises a controller for generating a switching control signal. (Specification, page 9, lines 17-21, and FIG. 10, 1014). The transmission apparatus further comprises a switch for switching the amplified radio signal from the power amplifier between a first and a second antenna in response to the switching control signal. (Specification, page 20, lines 17-21, and FIG. 11, 1128). The switching control signal is generated such that the switching occurs only in a non-transmission period of a last time slot within a sub-frame. (Specification, page 22, line 27, through page 23, line 1, and page 23, lines 12-18, and FIG. 13A). The sub-frame includes a plurality of time slots. Each time slot includes a transmission period followed by a non-transmission period. The non-transmission period of a last time slot is a non-transmission period intervening between sub-frames. (Specification, page 18, lines 2-14, and FIG. 6).

The invention, as recited in Claim 5, relates to a transmission method in a CDMA (Code Division Multiple Access) mobile communication system for transmitting a modulated radio signal using a plurality of antennas. (Specification, page 15, lines 24-25). The modulated radio signal is amplified in a transmission period. (Specification, page 20, line 15, and FIG. 11, 1126). A switching control signal is generated. (Specification, page 9, lines 17-21, and FIG. 10, 1014). The amplified radio signal is switched between a first and a second antenna in response to the switching control signal. (Specification, page 20, lines 17-21, and FIG. 11, 1128). The switching control signal is generated such that the switching occurs only in a non-transmission period of a last time slot within a sub-frame. (Specification, page 22, line 27, through page 23, line 1, and page 23, lines 12-18, and FIG. 13A). The sub-frame includes a plurality of time slots. Each time slot includes a transmission period followed by a non-transmission period. The non-transmission period of a last time slot is a

[1] Although a citation for each feature of the claims is provided herein, Appellants note that support may be found elsewhere in the written description.

non-transmission period intervening between sub-frames. (Specification, page 18, lines 2-14, and FIG. 6).

The invention, as recited in Claim 8, relates to a transmission apparatus in a CDMA (Code Division Multiple Access) mobile communication system for transmitting a modulated radio signal using a plurality of antennas. (Specification, page 15, lines 24-25). The transmission apparatus comprises a power amplifier for amplifying the modulated radio signal in a transmission period. (Specification, page 20, line 15, and FIG. 11, 1126). The transmission apparatus also comprises a controller for generating a switching control signal. (Specification, page 9, lines 17-21, and FIG. 10, 1014). The transmission apparatus further comprises a switch for switching the amplified radio signal from the power amplifier between a first and a second antenna in response to the switching control signal. (Specification, page 20, lines 17-21, and FIG. 11, 1128). The switching control signal is generated such that the switching occurs only in a guard period of a last time slot within a sub-frame. (Specification, page 22, line 27, through page 23, line 1, and page 23, lines 12-18, and FIG. 13A). The sub-frame includes a plurality of time slots. Each time slot includes a transmission period followed by a guard period. The guard period of a last time slot is a guard period intervening between sub-frames. (Specification, page 18, lines 2-14, and FIG. 6).

The invention, as recited in Claim 18, relates to a transmission method in a CDMA (Code Division Multiple Access) mobile communication system for transmitting a modulated radio signal using a plurality of antennas. (Specification, page 15, lines 24-25). The modulated radio signal is amplified in a transmission period. (Specification, page 20, line 15, and FIG. 11, 1126). A switching control signal is generated. (Specification, page 9, lines 17-21, and FIG. 10, 1014). The amplified radio signal is switched between a first and a second antenna in response to the switching control signal. (Specification, page 20, lines 17-21, and FIG. 11, 1128). The switching control signal is generated such that the switching occurs only in a guard period of a last time slot within a sub-frame. (Specification, page 22, line 27, through page 23, line 1, and page 23, lines 12-18, and FIG. 13A). The sub-frame includes a plurality of time slots. Each time slot includes a transmission period

followed by a guard period. The guard period of a last time slot is a guard period intervening between sub-frames. (Specification, page 18, lines 2-14, and FIG. 6).

The invention, as recited in Claim 38, relates to a transmission apparatus in a CDMA (Code Division Multiple Access) mobile communication system for transmitting a modulated radio signal using a plurality of antennas. (Specification, page 15, lines 24-25). The transmission apparatus comprises an encoder for encoding data, an interleaver for interleaving the encoded data, a demultiplexer for demultiplexing the interleaved data into I channel data and Q channel data, an I channel spreader for spreading the I channel data, an I channel scrambler for scrambling the spread I channel data, a Q channel spreader for spreading the Q channel data, and a Q channel scrambler for scrambling the spread Q channel data. (Specification, page 19, line 19, through page 20, line 5, and FIG. 11, 1100-1112). The transmission apparatus also comprises a time division multiplexer for time multiplexing the spread I channel data with an I channel midamble sequence, and time multiplexing the spread Q channel data with a Q channel midamble sequence. (Specification, page 20, lines 5-8, and FIG. 11, 1114). The transmission apparatus further comprises an I channel finite impulse response filter for pulse shaping the multiplexed I channel data, a Q channel finite impulse response filter for pulse shaping the multiplexed Q channel data, an I channel multiplier for modulating the pulse shaped I channel data, a Q channel multiplier for modulating the pulse shaped Q channel data, an adder for adding the modulated I channel data and the modulated Q channel data, a power amplifier for amplifying the added I and Q channel data, and a controller for generating a switching control signal. (Specification, page 20, lines 8-15, and FIG. 11, 1116-1126). The transmission apparatus additionally comprises a switch for switching during a non-transmission period the amplified I and Q channel data between a first and a second antenna in response to the switching control signal. (Specification, page 20, lines 17-21, and FIG. 11, 1128). The switching control signal is generated such that the switching occurs only in a non-transmission period of a last time slot within a sub-frame. (Specification, page 22, line 27, through page 23, line 1, and page 23, lines 12-18, and FIG. 13A). The sub-frame includes a plurality of time slots. Each time slot includes a transmission period followed by a non-transmission period. The non-transmission period of a last

time slot is a non-transmission period intervening between sub-frames. (Specification, page 18, lines 2-14, and FIG. 6).

The invention, as recited in Claim 40, relates to a transmission apparatus for a Narrow Band Time Division Duplex (NBTDD) Code Division Multiple Access (CDMA) mobile communication system operating under a Time Switched Transmit Diversity (TSTD) scheme. (Specification, page 15, lines 24-25). The transmission apparatus is for transmitting a modulated radio signal using a plurality of antennas. The transmission apparatus comprises a power amplifier for amplifying a modulated radio signal, a controller for generating a switching control signal, and a switch for switching the amplified modulated radio signal from the power amplifier between a first antenna and a second antenna in response to the switching control signal. (Specification, page 9, lines 17-21, page 20, line 15-21, and FIG. 10, 1014 and FIG. 11, 1126-1128). A sub-frame includes a plurality of time slots. Each time slot comprises two data parts, a midamble intervening between the data parts: and a guard period for dividing consecutive time slots. (Specification, page 18, lines 2-14, and FIG. 6). The controller is adapted to generate the switching control signal such that the switching occurs in a guard period of a last time slot of each sub-frame, and the guard period of a last time slot of a sub frame corresponds to a non-transmission period intervening between sub-frames. (Specification, page 22, line 27, through page 23, line 1, and page 23, lines 12-18, and FIG. 13A).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether Claims 1, 3, 5, 7, 8, 11, 12, 14, 15, 17, 18, 21, 22, 24, 25, 27 and 38-41 are unpatentable under 35 U.S.C. §103(a) over *Applicants' Admitted Prior Art* (hereinafter, *AAPA*) in view of WO 95/32558 to *Heikkinen et al.* (hereinafter, *Heikkinen*) and U.S. Patent No. 6,330,458 to *Lamoureux et al.* (hereinafter, *Lamoureux*).

ARGUMENT

1. The rejected claims are patentable over the combination of *AAPA*, *Heikkinen* and *Lamoureux*

A. Independent Claim 1

The Examiner contends that *AAPA* teaches or suggests each element of Claim 1 with the exception of a controller for generating a switching control signal and a switch for switching the amplified radio signal from the power amplifier between a first and a second antenna in response to the switching control signal. The Examiner cites *Heikkinen* and *Lamoureux* in an attempt to remedy these deficiencies.[2]

Claim 1 recites in part that the switching control signal is generated such that the switching occurs only in a non-transmission period of a last time slot within a sub-frame. The sub-frame includes a plurality of time slots. Each time slot includes a transmission period followed by a non-transmission period. The non-transmission period of a last time slot is a non-transmission period intervening between sub-frames.

In the claims of the present application, a switching control signal is generated such that the switching occurs only in a non-transmission period (or guard period) of a last time slot within a sub-frame. The non-transmission period of a last time slot is a non-transmission period intervening between the sub-frames. That is, in each frame, the switching only occurs once and only in one specific non-transmission period or guard period located at a last time slot within a sub-frame.

In *Lamoureux* the switching can occur in any, all or none of the guard periods.[3] There is no specific requirement that switching occur only once in a frame and only in a non-transmission period (or guard period) of a last time slot within a sub-frame. *AAPA* also teaches that switching can occur in various time slots and at various times.[4]

Thus the combination of *Lamoureux* and the *AAPA* would only result in a switching that occurs whenever and wherever in a frame. This cannot be equated with a switching that occurs only

[2] See Final Office Action dated January 5, 2010, pages 2-4.
[3] See *Lamoureux*, column 5, lines 20-28.

in a non-transmission period (or guard period) of a last time slot within a sub-frame as recited in the claims of the present application.

Further, in Fig. 4, *Lamoureux* discloses switching in a last time slot occurs in a guard time located before the last time slot. Whereas, in the claims of the present application, switching in a last time slot occurs only in a non-transmission period located after the last time slot i.e. in the guard period. That is, in the claims of the present application, the switching occurs in the boundary between the sub-frames, whereas in *Lamoureux*, the switching does not occur in the boundary between sub-frames.

Further, in Fig. 4, *Lamoureux* teaches that the switching in a first time slot occurs in a guard time located before the first time slot within a next sub-frame following the existing sub-frame. This feature of *Lamoureux* is different from that which is recited in the claims of the present application.

Therefore, *Lamoureux* fails to disclose at least the limitation of the switching control signal generated such that the switching occurs only in a non-transmission period of a last time slot within a sub-frame, as recited in the claims of the present application.

As is well known, in common TDD CDMA mobile communication systems, data is transmitted in a sub-frame unit configured for the uplink and the downlink. Since data transmission is performed using a sub-frame as a unit, the claims of the present application suggest using a switching pattern such that the switching occurs in a non-transmission period of a last time slot within a sub-frame. *Lamoureux* does not teach or disclose this switching pattern of the claims of the present application.

Moreover, when a switching occurs in each time slot as disclosed in *Lamoureux*, this can require that a particular slot needs to be transmitted through a particular antenna. However, the claims of the present application teach only one switching within a sub-frame by using a sub-frame unit for data transmission to prevent this inefficient performance.

Heikkinen fails to provide any disclosure that remedies the deficiencies of *Lamoureux* and *AAPA* described above. Thus, the combination of the *AAPA*, *Heikkinen* and *Lamoureux* does not

[4] See Specification, page 9, lines 18-21.

teaeh or disclose eaeh and every element of Claim 1. Aeeordingly, Claim 1 is patentable over the eombination of *AAPA*, *Heikkinen* and *Lamoureux*.

B. Independent Claims 5, 8, 18, 38 and 40

The Examiner also rejected independent Claims 5, 8, 18, 38 and 40 under 35 U.S.C. §103(a) eontending that Claims, 5, 8, 18, 38 and 40 contained similar reeitations as those set forth in Claim 1.[5]

Appellants assert that Claims 5, 8, 18, 38 and 40 are patentable for at least the reasons presented above with regard to Claim 1. More specifieally, Claims 5, 8, 18, 38 and 40 eaeh recite either "wherein the non-transmission period of a last time slot is a non-transmission period intervening between sub-frames", "wherein the guard period of a last time slot is a guard period intervening between sub-frames", or "wherein...the guard period of a last time slot of a sub frame corresponds to a non-transmission period intervening between sub-frames." As described above with regard to Claim 1, the combination of *AAPA*, *Heikkinen* and *Lamoureux* fails to teaeh, suggest or render obvious these elements.

Aeeordingly, the combination of *AAPA*, *Heikkinen* and *Lamoureux* fails to diselose eaeh and every element of Claims 5, 8, 18, 38 and 40. Therefore, it is respeetfully submitted that Claims 5, 8, 18, 38 and 40 are patentable over the eombination of *AAPA*, *Heikkinen* and *Lamoureux*.

C. Dependent Claims 3, 7, 11, 12, 14, 15, 17, 21, 22, 24, 25, 27, 39 and 41

Claims 3, 7, 11, 12, 14, 15, 17, 21, 22, 24, 25, 27, 39 and 41 are patentable at least by virtue of their dependeney from independent Claims 1, 5, 8, 18, 38 and 40. The patentability of the independent elaims is deseribed above. It is respeetfully submitted that beeause the above arguments plaee the independent claims in eondition for allowanee, these dependent elaims are also believed to be in eondition for allowanee. Therefore, the combination of *AAPA*, *Heikkinen* and *Lamoureux* fails to disclose eaeh and every element of the dependent claims, and it is respeetfully

submitted that Claims 3, 7, 11, 12, 14, 15, 17, 21, 22, 24, 25, 27, 39 and 41 are patentable over the combination of *AAPA*, *Heikkinen* and *Lamoureux*.

Accordingly, Appellants assert that Claims 1, 3, 5, 7, 8, 11, 12, 14, 15, 17, 18, 21, 22, 24, 25, 27 and 38-41 are allowable over the combination of *AAPA*, *Heikkinen* and *Lamoureux*, and respectfully request withdrawal of the rejection under 35 U.S.C. §102(b).

CONCLUSION

It is well settled that in order for a rejection under 35 U.S.C. §103(a) to be appropriate, the claimed invention must be shown to be obvious in view of the prior art as a whole. A claim may be found to be obvious if it is first shown that all of the recitations of a claim are taught in the prior art or are suggested by the prior art. In re Royka, 490 F.2d 981, 985, 180 U.S.P.Q. 580, 583 (C.C.P.A. 1974), cited in M.P.E.P. §2143.03.

The Examiner has failed to show that all of the recitations of Claims 1, 3, 5, 7, 8, 11, 12, 14, 15, 17, 18, 21, 22, 24, 25, 27 and 38-41 are taught or suggested by the art of record, or the combination thereof. Accordingly, the Examiner has failed to make out a prima facie case for an obviousness rejection.

[5] See Final Office Action dated January 5, 2010, page 2.

As the Examiner has failed to make out a prima facie case for the obviousness rejection, the rejections of Claims 1, 3, 5, 7, 8, 11, 12, 14, 15, 17, 18, 21, 22, 24, 25, 27 and 38-41 must be reversed.

Dated: August 4, 2010

By: 

Paul J. Farrell
Reg. No.: 33,494
Attorney for Applicant(s)/Appellant(s)

THE FARRELL LAW FIRM, LLP
290 Broadhollow Rd., Suite 210E
Melville, New York 11747
(516) 228-3565 (tel)
(516) 228-8475 (fax)

CLAIMS APPENDIX

1. (Previously Presented) A transmission apparatus in a CDMA (Code Division Multiple Access) mobile communication system for transmitting a modulated radio signal using a plurality of antennas, the transmission apparatus comprising:

a power amplifier for amplifying the modulated radio signal in a transmission period;

a controller for generating a switching control signal; and

a switch for switching the amplified radio signal from the power amplifier between a first and a second antenna in response to the switching control signal, the switching control signal generated such that the switching occurs only in a non-transmission period of a last time slot within a sub-frame, the sub-frame includes a plurality of time slots, each time slot includes a transmission period followed by a non-transmission period,

wherein the non-transmission period of a last time slot is a non-transmission period intervening between sub-frames.

2. (Cancelled)

3. (Original) The transmission apparatus as claimed in claim 1, wherein the non-transmission period of the last time slot has a length of 96 chips.

4. (Original) The transmission apparatus as claimed in claim 1, wherein the controller disables the power amplifier at a start point of the non-transmission period of the last time slot and then outputs the switching control signal when an output level of the power amplifier is lowered to a predetermined level.

5. (Previously Presented) A transmission method in a CDMA (Code Division Multiple Access) mobile communication system for transmitting a modulated radio signal using a plurality of antennas, the transmission method comprising the steps of:

amplifying the modulated radio signal in a transmission period;

generating a switching control signal; and

switching the amplified radio signal between a first and a second antenna in response to the switching control signal, the switching control signal generated such that the switching occurs only in a non-transmission period of a last time slot within a sub-frame, the sub-frame includes a plurality of time slots, each time slot includes a transmission period followed by a non-transmission period,

wherein the non-transmission period of a last time slot is a non-transmission period intervening between sub-frames.

6. (Cancelled)

7. (Original) The transmission method as claimed in claim 5, wherein the non-transmission period of the last time slot has a length of 96 chips.

8. (Previously Presented) A transmission apparatus in a CDMA (Code Division Multiple Access) mobile communication system for transmitting a modulated radio signal using a plurality of antennas, the transmission apparatus comprising:

a power amplifier for amplifying the modulated radio signal in a transmission period;

a controller for generating a switching control signal; and

a switch for switching the amplified radio signal from the power amplifier between a first and a second antenna in response to the switching control signal, the switching control signal generated such that the switching occurs only in a guard period of a last time slot within a sub-

frame, the sub-frame includes a plurality of time slots, each time slot includes a transmission period followed by a guard period,

wherein the guard period of a last time slot is a guard period intervening between sub-frames.

9-10. (Cancelled)

11. (Previously Presented) The transmission apparatus as claimed in claim 8, wherein the guard period has a length of 96 chips.

12. (Previously Presented) The transmission apparatus as claimed in claim 8, wherein the guard period is a downlink non-transmission period of the sub-frame.

13. (Cancelled)

14. (Previously Presented) The transmission apparatus as claimed in claim 12, wherein the downlink non-transmission period is 875μsec.

15. (Previously Presented) The transmission apparatus as claimed in claim 8, wherein the guard period is an uplink non-transmission period of the sub-frame.

16. (Cancelled)

17. (Previously Presented) The transmission apparatus as claimed in claim 15, wherein the uplink non-transmission period is 825μsec.

18. (Previously Presented) A transmission method in a CDMA (Code Division Multiple Access) mobile communication system for transmitting a modulated radio signal using a plurality of antennas, the transmission method comprising the steps of:

amplifying the modulated radio signal in a transmission period;

generating a switching control signal; and

switching the amplified radio signal between a first and a second antenna in response to the switching control signal, the switching control signal generated such that the switching occurs only in a guard period of a last time slot within a sub-frame, the sub-frame includes a plurality of time slots, each time slot includes a transmission period followed by a guard period,

wherein the guard period of a last time slot is a guard period intervening between sub-frames.

19-20. (Cancelled)

21. (Previously Presented) The transmission method as claimed in claim 18, wherein the guard period has a length of 16 chips.

22. (Previously Presented) The transmission method as claimed in claim 18, wherein the guard period is a downlink non-transmission period of the sub-frame.

23. (Cancelled)

24. (Previously Presented) The transmission method as claimed in claim 22, wherein the downlink non-transmission period is 875μsec.

25. (Previously Presented) The transmission method as claimed in claim 18, wherein the guard period is an uplink non-transmission period of the sub-frame.

26. (Cancelled)

27. (Previously Presented) The transmission method as claimed in claim 25, wherein the uplink non-transmission period is 825μsec.

28-37. (Cancelled)

38. (Previously Presented) A transmission apparatus in a CDMA (Code Division Multiple Access) mobile communication system for transmitting a modulated radio signal using a plurality of antennas, the transmission apparatus comprising:

an encoder for encoding data;

an interleaver for interleaving the encoded data;

a demultiplexer for demultiplexing the interleaved data into I channel data and Q channel data;

an I channel spreader for spreading the I channel data;

an I channel scrambler for scrambling the spread I channel data;

a Q channel spreader for spreading the Q channel data;

a Q channel scrambler for scrambling the spread Q channel data;

a time division multiplexer for time multiplexing the spread I channel data with an I channel midamble sequence, and time multiplexing the spread Q channel data with a Q channel midamble sequence;

an I channel finite impulse response filter for pulse shaping the multiplexed I channel data;

a Q channel finite impulse response filter for pulse shaping the multiplexed Q channel data;

an I channel multiplier for modulating the pulse shaped I channel data;

a Q channel multiplier for modulating the pulse shaped Q channel data;

an adder for adding the modulated I channel data and the modulated Q channel data;

a power amplifier for amplifying the added I and Q channel data;

a controller for generating a switching control signal; and

a switch for switching during a non-transmission period the amplified I and Q channel data between a first and a second antenna in response to the switching control signal, the switching control signal generated such that the switching occurs only in a non-transmission period of a last time slot within a sub-frame, the sub-frame includes a plurality of time slots, each time slot includes a transmission period followed by a non-transmission period,

wherein the non-transmission period of a last time slot is a non-transmission period intervening between sub-frames.

39. (Previously Presented) The transmission apparatus as claimed in claim 1, wherein the switching occurs in the non-transmission period of a last time slot within each sub-frame.

40. (Previously Presented) A transmission apparatus for a Narrow Band Time Division Duplex (NBTDD) Code Division Multiple Access (CDMA) mobile communication system operating under a Time Switched Transmit Diversity (TSTD) scheme, the transmission apparatus for transmitting a modulated radio signal using a plurality of antennas, the transmission apparatus comprising:

a power amplifier for amplifying a modulated radio signal;

a controller for generating a switching control signal; and

a switch for switching the amplified modulated radio signal from the power amplifier between a first antenna and a second antenna in response to the switching control signal,

wherein a sub-frame includes a plurality of time slots,

wherein each time slot comprises:

two data parts;

a midamble intervening between the data parts; and

a guard period for dividing consecutive time slots; and

wherein said controller is adapted to generate the switching control signal such that the switching occurs in a guard period of a last time slot of each sub-frame, and the guard period of a last time slot of a sub frame corresponds to a non-transmission period intervening between sub-frames.

41. (Previously Presented) The transmission apparatus as claimed in claim 40, wherein the switching occurs at identical periodic intervals.

EVIDENCE APPENDIX

There is no evidence submitted pursuant to 37 C.F.R. 1.130, 1.131, 1.132 or entered by the Examiner and relied upon by Appellants.

RELATED PROCEEDINGS APPENDIX

There are no known decisions rendered by a court or the Board in any proceeding identified pursuant to paragraph (c)(1)(ii) of 37 C.F.R. 41.37.